Atty's Docket No.: 1789-05303; Serial No.: 09/912,923 Applicants: James L. Tour, et al

Applicants: James L. Tour, et al Title: Programmable Molecular Device

Sheet 1 of 4

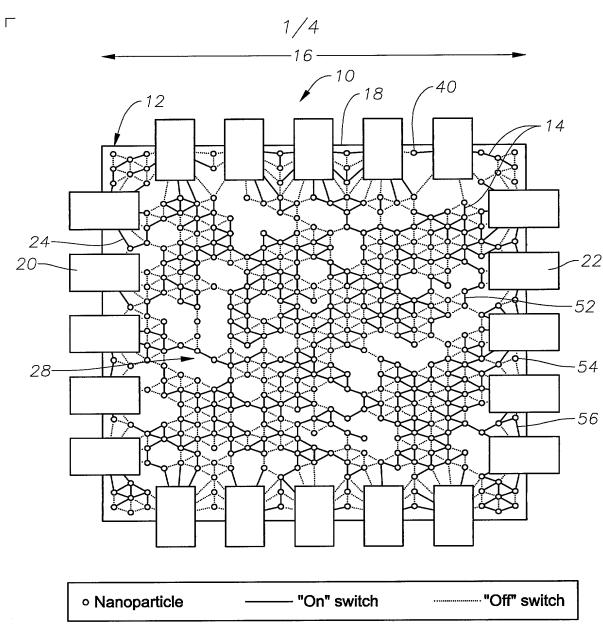
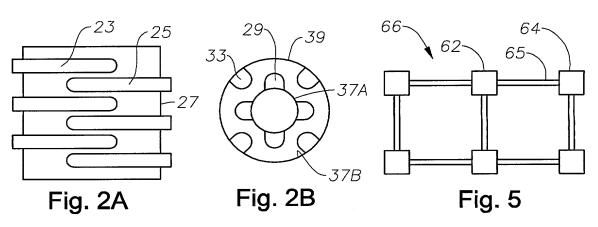


Fig. 1

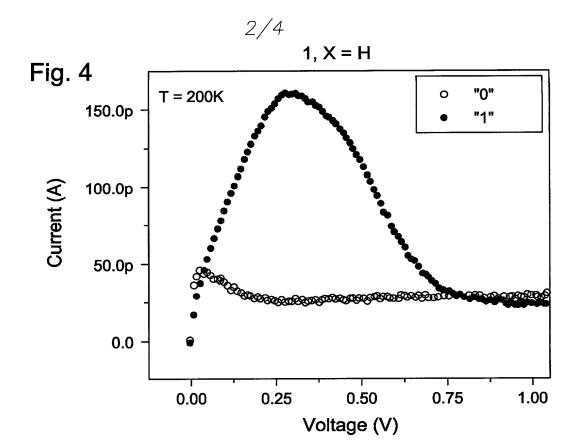


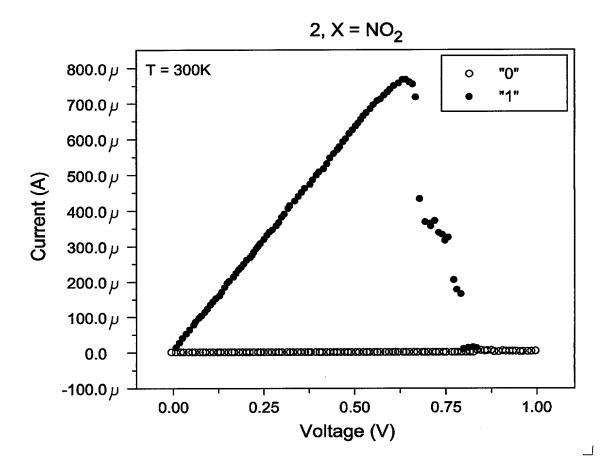
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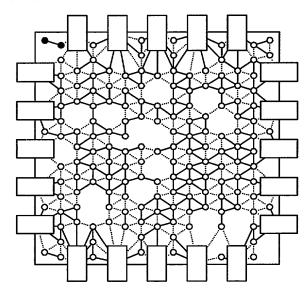


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$$\begin{array}{c}
3/4 \\
30 \\
35 \\
NO_{2} \\
\hline
31 \\
NO_{2} \\
\hline
31 \\
32 \\
34 \\
2, X = NO_{2}
\end{array}$$
Fig. 3

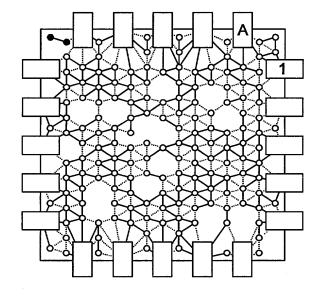
Untrained Nanocell

Fig. 7



Nanocell Trained as Inverter

Fig. 8



Inverter Truth Table		
Input A	Output 1	
0	1	
1	0	

 Γ

$$X \longrightarrow X \longrightarrow X$$

Γ_

 $X \longrightarrow H_2N$

X = N, Y = ethynylpyridine X = CSAc, Y = ethynylpyridine X = N, Y = phenyl

Fig. 6

Nanocell Trained as Nand

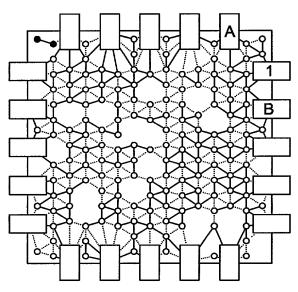
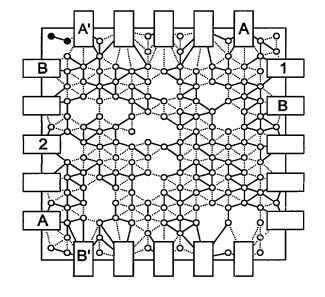


Fig. 9

Nand Truth Table			
Input A	Input B	Output 1	
0	0	1	
0	1	1	
1	0	1	
1	1	0	

Nanocell Trained as Inverse Half Adder

Fig. 10



Inverse of Half Adder Truth Table				
Input A	Input B	Output 1	Output 2	
0	0	1	1	
0	1	1	0	
1	0	1	0	
1	1	0	1	